

PROCEEDINGS
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A NEW FIR FROM ARIZONA, *ABIES ARIZONICA*.

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In the summer of 1889, when making a biological survey of the San Francisco Mountain region in Arizona, I discovered a new fir with whitish corky bark. The scales of the cones were shed before the end of September, and no perfect cones were brought back. In my report on the 'Forest Trees of the San Francisco Mountain Region' I described this 'white cork-bark fir' under the head of *Abies subalpina* Engelm. [= *Abies lasiocarpa* Hooker], with the following explanation: "I believe this tree to be distinct from true *A. subalpina*, but in the absence of material for direct comparison I am unwilling to separate it." My original account of the species is as follows: "This beautiful fir, unique in the color and character of its bark, is one of the most conspicuous trees on San Francisco Mountain between the altitudes of 2,725 and 2,900 meters (8,950 to 9,500 feet). On the north side of a large butte, just south of Walker Lake crater, it descends to 2,600 meters (8,500 feet). The bark is a fine elastic cork of uniform texture, and free from hard particles. It averages about 6 millimeters in thickness and is very durable, frequently remaining intact while the wood rots away. Large pieces of it, still retaining their elasticity, may be stripped from dead trees and from logs upon the ground. It is sculptured by irregularly interrupted longitudinal depressions or grooves, and is ornamented by fine, parallel, wavy lines. Its color varies from creamy white to gray, and the surface has a velvety texture. The leaves are short, and the scales of the large cones are deciduous while still on the tree. In fact, it was almost impossible to secure a perfect cone as early as the latter part of September. * * *

"On Kendrick Peak it grows from the south rim of the crater (altitude about 2,800 meters, or 9,200 feet) to the summit (a little above 3,050 meters, or 10,000 feet)."*



FIG. 24.—Bark of *Abies arizonica* (natural size).

Early in July of the present year (1896) I again visited San Francisco Mountain and, in company with Dr. B. E. Fernow, had the satisfaction of obtaining upper and lower branches, fresh cones, and bark of the new tree, which may be defined as follows:

***Abies arizonica* sp. nov.**

Type from west slope of San Francisco Mountain, Arizona. Altitude, about 3,000 meters (approximately 10,000 feet). Collected July 2, 1896. No. 270,604. U. S. National Herbarium.

Range.—Hudsonian Zone of San Francisco and Kendrick Mountains, Arizona; not reaching timber line.

Characters.—Size of tree, medium or rather small, averaging about 15 meters in height and rarely 300 millimeters in diameter at base; bark a highly elastic fine-grained cork, whitish or grayish in color, usually creamy white, with irregularly sinuous grayish ridges (Fig. 24); leaves of cone-bearing branches thick,

subtriangular in transverse section, and sharp-pointed at apex (about 20 millimeters in length); leaves of lower branches much longer, flatter,

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blunt, and notched at apex (about 25–30 millimeters in length); cones dark purple, slender, medium, or rather small, those of type specimen (not full grown) measuring about 50 x 20 millimeters; scales much broader than long, strongly convex laterally (Fig. 25, c), purple on both sides; bract (without awn) reaching to or past middle of scale; body of bract much broader than long.

Remarks.—The only tree with which the white cork-bark fir needs comparison is the subalpine fir (*Abies lasiocarpa* Hooker = *A. subalpina* Engelm.), from which it differs in leaves, bark, and cones. In *Abies lasiocarpa* the leaves of the lower branches average much shorter than in *A. arizonica*; the bark is hard instead of elastic-corky, and is variable in color, usually dark grayish brown blotched with whitish; the cones are larger, and the scales and bracts differ widely in shape and proportions. In *A. lasiocarpa* (Fig. 25, a and b) the scales are longer than broad, the body of the bract is less than one-third the length of the body of the scale, and the seed wings are about twice as long as broad; in *A. arizonica* (Fig. 25, c) the scales are much broader than long, the body of the bract is more than half the length of the scale, and the seed wings are about as broad as long.

The form of the scale and relative size of the bract probably change somewhat with age, but in the accompanying figures the immature scale of *Abies arizonica* (Fig. 25, c) is contrasted with a still younger scale of *A. lasiocarpa* (b), as well as with the mature scale of the latter (a). The young cone of *A. lasiocarpa*, from which the scale figured (b) is taken, is decidedly smaller than the cone of *A. arizonica*, from which figure c is taken, while the adult cone of *A. lasiocarpa* is more than twice as large. Both of the specimens figured of *A. lasiocarpa* came from Mount Hood, at the north end of the Cascade Range in Oregon, which is probably near the type locality of the species. I am indebted to Mr. F. V. Coville for the opportunity of figuring the young cone

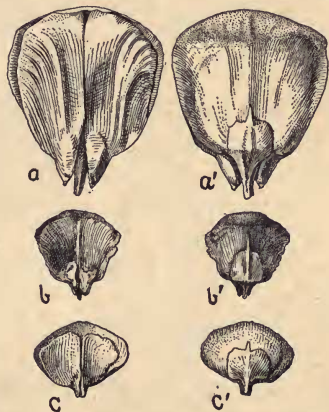


FIG. 25.—Scales of cones (natural size).

a. *Abies lasiocarpa*, mature.

b. *Abies lasiocarpa*, young.

c. *Abies arizonica*, young.

a, b, c. Upper side, showing seed wings.

a', b', c'. Under side, showing bracts.

of *lasiocarpa*. *Abies arizonica* is a much smaller tree than *A. lasiocarpa*.

Both are highly boreal species, belonging to the Hudsonian Zone, though *A. arizonica* fails to reach the upper or timber-line belt of this zone. *Abies lasiocarpa* ranges from southern Alaska and British Columbia southward, over the Rocky Mountains into Utah and Colorado, and over the Cascade Range to southern Oregon. *Abies arizonica*, on the other hand, is restricted, so far as known, to San Francisco Mountain and neighboring peaks on the summit of the plateau in northern Arizona.